KYL-320I Ultra Wireless Transceiver Data Module User Manual

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Before using the product please read the use manual carefully.
Any question in technical, you can contact us.
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I: About KYL-320I

KYL-320I, the ultra wireless transceiver data module is used as the wireless data transceiver in short-ranges, with the small size, weight and power consumption and good stability and reliability. Narrowband low power UHF wireless data transmitters and receivers with channel spacing as low as 25 kHz.

If necessary, we can provide USB interface to make it easy to settle the question of Power Supply for Mini computer and PC users.

II: Features:

1.Power and receiving sensitivity

The transmission power is<500Mw, Receiving sensitivity: -123dbm(1200bps),-118dbm(9600bps)

Transmission current<350mA, Receiving current<28mA, sleeping current <20uA.

2. Modulation mode and Frequency

Modulation mode: GFSK, Frequency: 433MHz. Also capable of 450/470/868/915MHz.

3. High anti- interference and low BER(Bit error Rate)

Based on the GFSK modulation mode, the high- efficiency forward error correction channel encoding technology is used to enhance data's resistance to both burst interference and random interference and the actual bit error rate of 10-5 ~ 10-6 can be achieved when channel bit error rate is 10-2.

4. Long transmission distance

Within the range of visibility, the reliable distance is >2km(BER=10-5/9600bps), >3km(BER=10-5/1200bps)when the height of antenna is 1.5m above ground in open area, Standard antenna is 10cm.

5. Transparent data interface

Transparent data interface is offered to meet any standard or nonstandard user protocol. Any false data generated in the air can be filtrated automatically (What has been received is exactly what has been transmitted). The change time between receiving and sending is <10ms.

6. Multi- channel

The standard KYL-320I configuration provides 8 channels, if the user needs, it can be extended to 16/32 interface, meeting the multiple

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communication combination mode of the user.

7. Large data buffer zone

Interface baud rate is 1200/2400/4800/9600bps with format of 8N1/8E1 and user can define it by itself, It can transmit unlimited data when Interface baud rate is not bigger than air effective baud rate band.

8. Intelligent data control and the user doesn't need to prepare excessive programs

Even for semi duplex communication, the user doesn't need to prepare excessive programs, only receiving/transmitting the data from the interface. KYL-320I will complete the other operations automatically, such as transmission/receiving conversion in the air, control, etc.

9. High reliability, small and light

By using monolithic radio-frequency integrated circuit and single-chip MCU, the transceivers have less peripheral circuits, high reliability, and low failure rate.

10. Three kinds of interface modes (TTL, RS-232, RS-485)

RS-232, RS-485 interface diversion chip, DB9 standard interface connector and special power connector are used.

11. Watchdog monitor

Watchdog monitors the inner function, so it can change the traditional product structure and also improve the reliability of our modules.

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III: Application of KYL-320I:

KYL-320I the ultra wireless transceiver data module is suitable for:

* AMR Automatic Meter Reading
* Wireless alarm and security systems
* Building automation, security, wireless monitoring and control of room equipment, Access Control System;
* Wireless data transmission, automatic data collection system;
* Low power telemetry
* 433 / 868 and 915 MHz ISM/SRD band systems
* Data radio can be used for Wireless conference voting system;
* Mapping;
* Radio modem can be used for Sports training & competition;
* Wireless dishes ordering;
* Wireless POS, PDA wireless smart terminal;
* RF modem can be used for Electronic bus station and intelligent traffic;
* RF transmitter Wireless electronic display screen and queuing machine;
* Wireless telemetry Charging for parking, parking lot;

* Wireless modem Automobile inspection and four-wheel orientation;
* Wireless sensor Industrial wireless remote control and air conditioning remote controller;
* Data communication used for railway, oil field, dock and army.
* LED display in thruway and public places
* Wireless RS232/RS485 conversion/connector;
* Point to multi-point wireless network, wireless on-the-spot bus and automatic data collection system;

IV: How to use the KYL-320I ultra wireless transceiver data module

KYL-320I provide RS-232, RS-485 and UART/TTL level interface port for direct connection with PC, RS485 devices, monolithic processors and other UART components kinds of applications.

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1. Power supply

KYL-320I work with supply voltage+5.0V DC. By using better ripple factor, KYL-320I transceivers can also share power supply with other equipment. If possible, a voltage-stabilizing chip with 5V voltage is more recommended as the only power supply than switch power supply. But if only switch power supply available, the jam by switch pulse to the transceivers should be avoided. In addition, the reliable grounding must be used if there is other device in the system equipment. In case of failing to connect with the ground, it can form its own grounding but must be absolutely separated from the municipal electric supply. If lower power for lower power consumption needed, we can design to meet users' demands.

2. Connection Definition with terminal

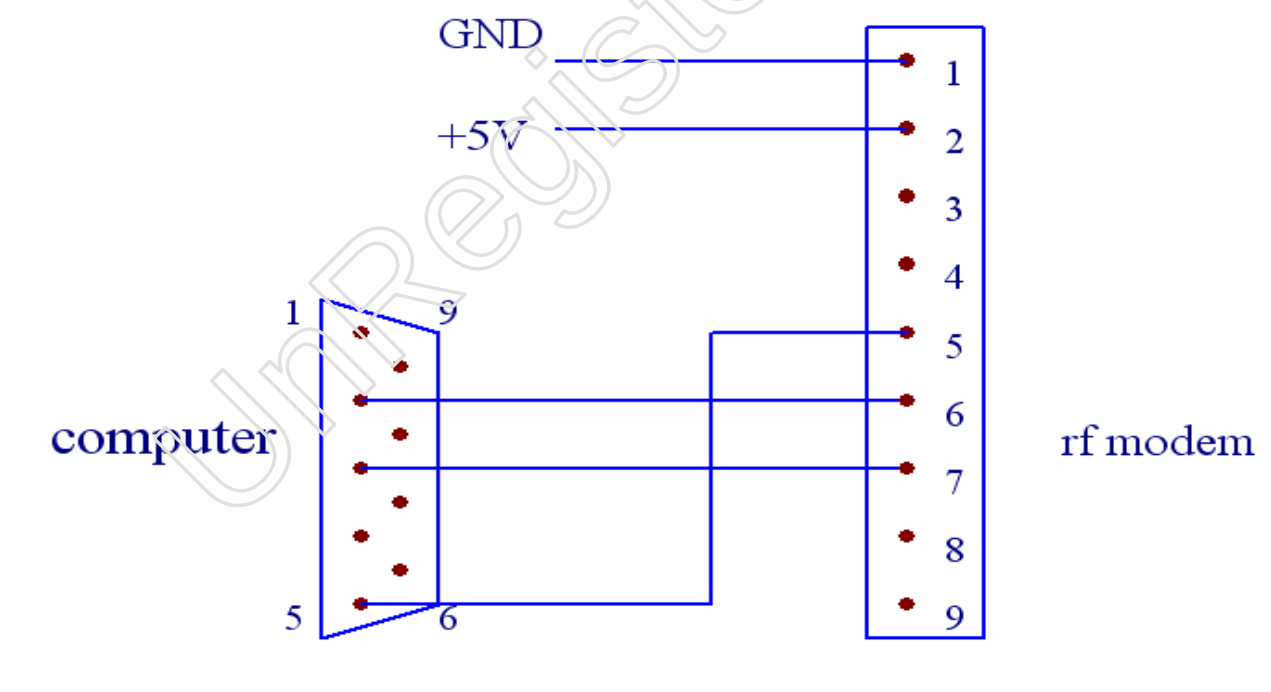
KYL-320I transceivers supply one 9-pin connector(JP1),their definitions and connection methods with terminals are shown in Table 1.

Table 1: JP1 Pin Definitions and connection methods

Pin No.	Signal Name	Function	Level	Connection with	Remarks

				terminal	
1	GND	Grounding of power supply		Ground	
2	Vcc	Power supply DC	5V		
3	RxD/TTL	Serial data input to the transceiver	TTL	TxD	
4	TxD/TTL	Transmitted data out of the transceiver	TTL	RxD	
5	SGND	Signal			
6	A (TXD)	A of RS-485(TxD of RS-232)		A(RxD)	
7	B (RXD)	B of RS-485(RxD of RS-232)		B(TxD)	
8	SLEEP	Sleep control (input)	TTL	Sleep signal	High level sleep
9	RESET	Reset signal(input)	TTL		Negative pulse reset

3. The connection schematic diagram between computer and our RF module



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4. Setting of channel, interface, and data format

Before using KYL-320I, the user needs to make simple configuration based on its own needs to determine the channel, interface mode and data format.

The user can change or view the module's interface baud rate, channel and address code. Parameter setting or reading as per

the testing software KYLPRO.exe in the PC (in products box).And the configuration is as follows:

i. Channel configuration:

Channel No.	Frequency	Channel No.	Frequency	Channel No.	Frequency	Channel No.	Frequency
1	429.0325 MHZ	2	430.0325 MHZ	3	431.0325 MHZ	4	432.0325 MHZ
5	433.0325 MHZ	6	434.0325 MHZ	7	435.0325 MHZ	8	436.0325 MHZ

Note: the frequency points corresponding to each channel can be adjusted based on the user's needs.

ii. The schematic diagram of setting the parameter as follows:

a. Connect the PC and module with data line

b. Double-click the "KYLPRO.EXE" PC software, then select "English" as follows:

c. Click "open port" of the submenu in the "Edit" of the main menu, it will appear the picture as follows, then user can set parameter through the small window.

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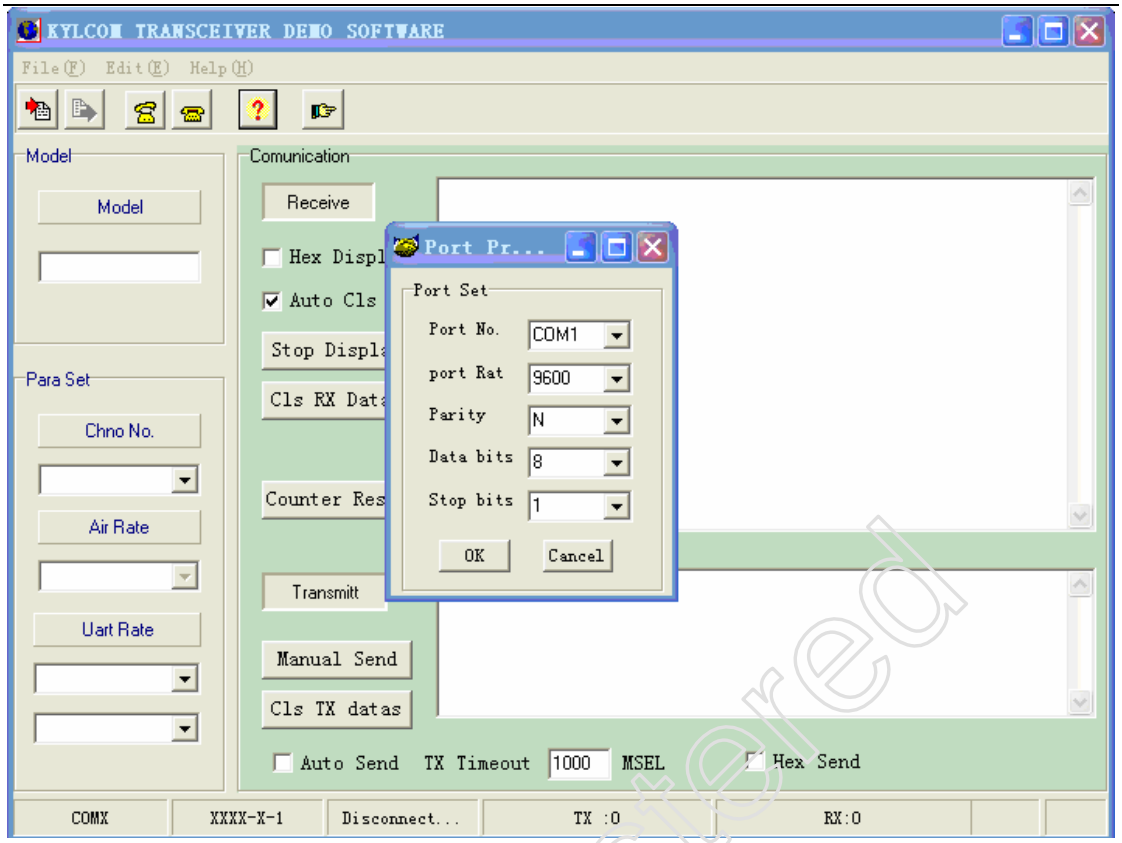

d. Click “read paras” of the submenu in “File” of the main menu.

It is a process to read data. During this process, the red indicator light of the module will glitter, when have checked out the transceiver, there will be clewed as “Read correct”, at the same time, the red indicator light will stop glittering. And there will display the current parameter of the RF module at the left window. The diagram as follows:

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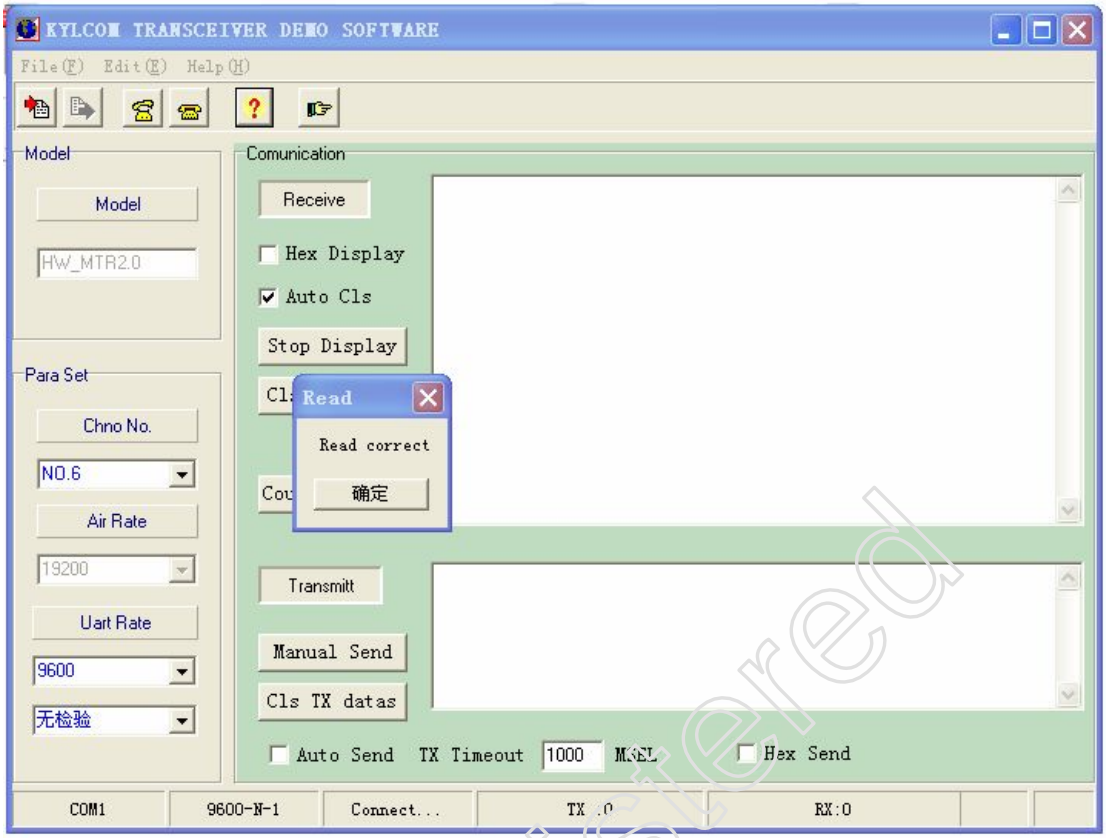

e. User can modify the parameter such as channel and interface rate according to actual demand through the button of the left window. After modifying click “write paras” of the submenu in “File” of the main menu, then there will clew “write correct”. At the same, the current parameter will be saved. The diagram as follows:

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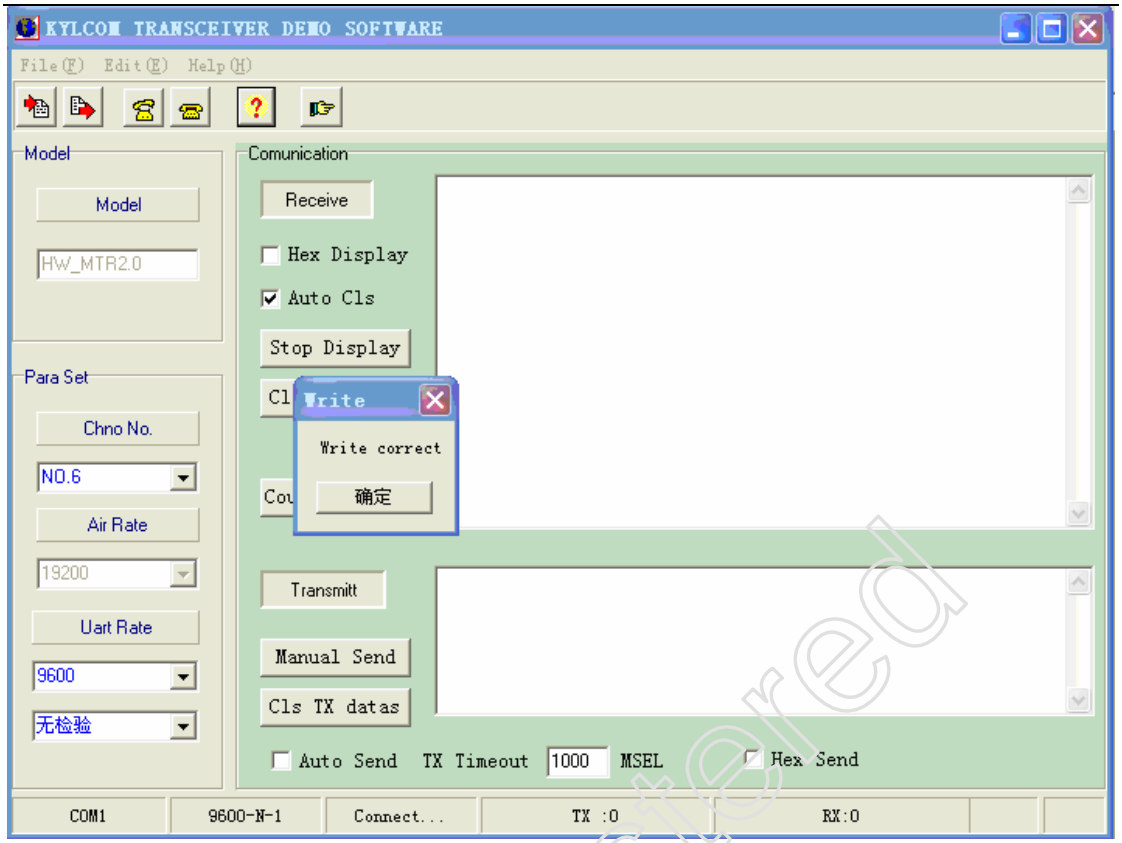
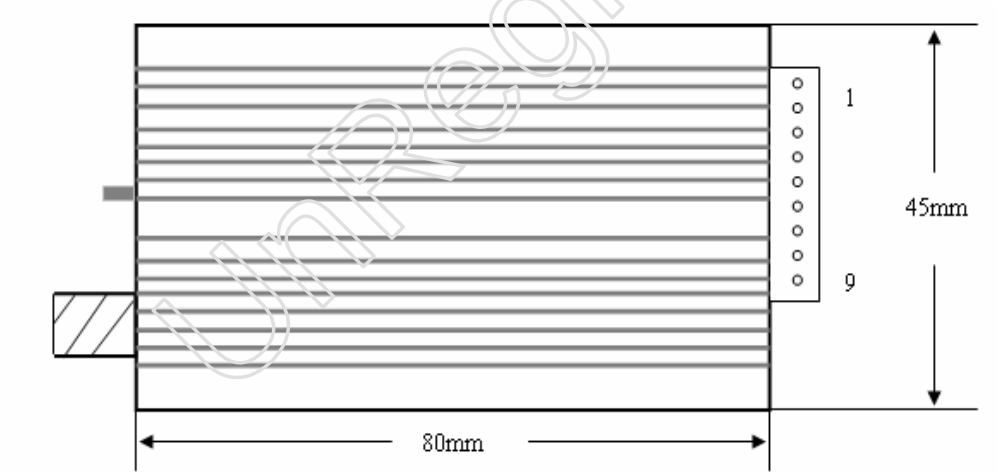


5. **Installation dimension:**



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6. Supported protocol and Transmit capability

KYL-320I standard transceiver offer transparent protocol to support various applications and protocols of users. If the user needs to decrease his cost or ease the workload of terminal CPU, we can add other specific functions based on the transparent protocol, such as addressing, data acquisition, command interpretation, etc.

As using FIFO mode, KYL-320I is able to satisfy user big data

package transmission.

7. Description of Indicator light

a. The red and green lights are on about 500Ms at the same time after supplying the electricity.

b. The red light is normally on when transmitting data, while the red light will crush out after ending the data.

c. The green light is normally on when receiving the air signal, while the green light will crush out after receiving the air signal.

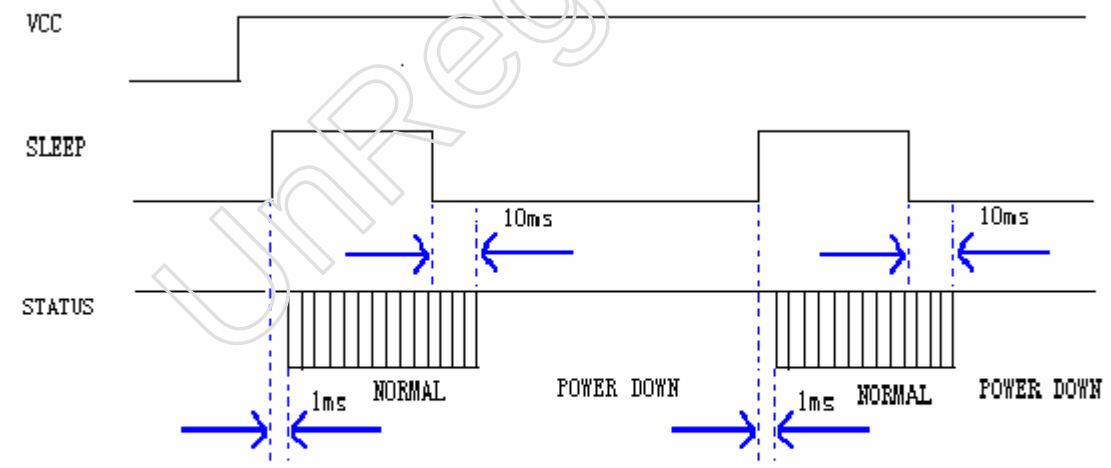
8. Sleep function instruction:

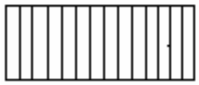
Due to reducing more consumption, KYL-320I transceivers support Sleep function. In sleep mode, the current consumption is <20uA.

The default set of sleep function is usually closed to ensure the reliability of preventing transceivers from getting in wrong sleep mode. The sleep function can be opened by KYL after informed or by user via programming them software.

a. How to use the sleep function:

The Sleep Timing diagram:




The shadow part is show that the RF module is under normal working state.

NOTICE:

The Pin8"SLP" in JP1 is the signal of sleep control. In high power level, when the transceivers stays in sleep mode, the conversion from idle mode to sleep will be finished in 1ms(It

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is means that the delay time(tc) of conversion between transmitting and receiving is less than 1Ms).The SLP signal can convert transceiver from idle to sleep mode in 1ms after rising edge. If the sleep signal arrives when the transceiver is transmitting data, the module will enter sleep mode after finishing transmission. From sleep mode to idle, it takes the transceiver 10ms after falling edge.

b. Attentions about use of sleep function:
When the sleep function enabled, any supply glitches, such as switch dithering, fire striking or quick switching on and off, could cause the transceiver to be switched to the wrong sleep mode. After switching on, users can avoid this error by making a compulsive restoration once after the CPU delays 150ms.

9. Standard configuration and Antenna configuration
i: Standard configuration:
* One KYL-320I RF module

* A 9pin flat Connection Line

* A whip antenna（about 10cm）

ii: Antenna configuration:
Many appropriative antennas for low power RF modules are selected for meeting different user antenna configuration. Please ask our Sales office for further information about the antenna's dimension and performance. The main options of antennas are exterior flagelliform rubber antenna with helical SMA joint, small osculum antenna, small rod antenna and elbow antenna. If the user has special demands on antennas, we can design and produce for them specially.

a. Helical SMA antennas: KYL-ANT-S868-5-SMA

b. Elbow antenna : KYL-ANT-S433L-10-ESMA

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c. Small rod antenna: KYL-ANT-S433-4-RSMA

d. Small osculum antenna: KYL-ANT-0433S-300H1.5-SMA

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V. Application of KYL-320I Networking

The communication channel of KYL-320I is half duplex, which is most suitable for the communication mode of point to multi-point. Under this mode, one master station must be set, and all of the rest are slave stations. A unique address is given to each station. The coordination of communication is controlled by master station that uses data frames containing address code to transmit data or command. Slave station will receive all of the data and command and compare the received address code with local address code. If they are different, the data will be deserted without any response. If those address codes are the same, it means the data is sent to the local. Slave station will make different responses according to the transmitted data or command and send back the data of response. All these jobs must be performed by upper protocol, and it is assured that there is only one transmitter-receiver in the state of transmission in the communication network at any instant moment so as to avoid the cross-interference.

KYL-320I can also be used for point-to- point communication

with easier operation. For the programming of serial port, all you have to do is to remember that its communication mode is semi duplex while always observing the time sequence of come-and-go for receiving and transmitting.

VI. Technical specification of KYL-320I

* Modulation mode: GFSK
* Working frequency: 433~915MHz (customized)
* Power supply: DC 5V (customized)
* RF power: ≤500mW (customized);
* Interface data rate: 1200/2400/4800/9600/38400bps, set before delivery.
* Receive current: <28mA (TTL connect)
* Receive sensitivity: -123dBm (1200bps);
  -118dBm (9600bps)
* Transmitting current: <350mA;
* Sleep current: <20uA;
* Interface data format: 8E1/8N1
* Working humidity: 10%~90%relative humidity without condensation
* Working temperature: -35℃~+75℃(industrial)
* RF Line-of-sight Range: 2km (BER=10-5@9600bps);
  3km(BER=10-5@1200bps);
* Size: 80mm*45mm*20mm (without antenna port).

VII: Explanation of type

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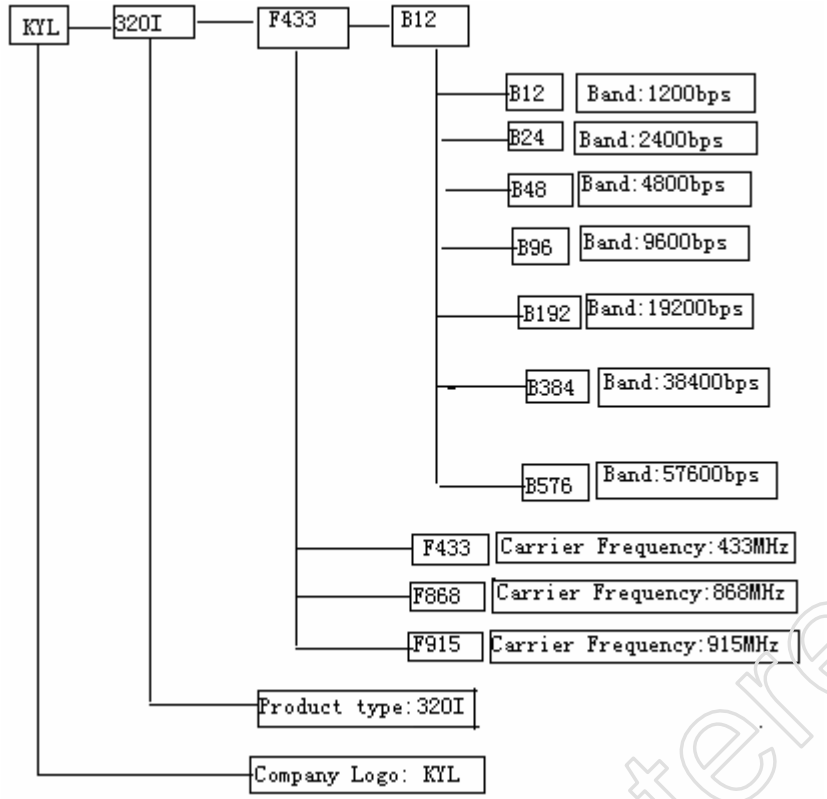

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